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REMARKS

Claims 2-5, 11-15, 17-24 and 24-28, as amended, and new claims 29-35 are presented for the Examiner's review and consideration. Of these claims, claims 29, 32 and 34 are in independent form. Claims 1, 6-10, 16 and 25 have been cancelled. The new independent claims have been drafted to further define the invention along the lines of discussion previously presented to distinguish these claims from the art. The amendments to the dependent claims are to conform them to the revised independent claims. These amendments are being made to reduce the issues for appeal in particular by placing the claim in condition for allowance. As no new matter has been introduced for the reasons set forth below, at a minimum these claim changes should be entered to eliminate a number of the prior rejections.

Rejection under 35 U.S.C. § 112

The Examiner rejected claims 1-5 and 16-28 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 16 and 25 have been cancelled and, therefore, the rejection is moot.

Rejection under 35 U.S.C. § 102(e)/103(a)

The Examiner rejected claims 1, 2, 5, 11 and 25-26 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2004/0087180 to Hishiya et al. ("Hishiya"). The Examiner rejected various claims under 35 U.S.C. § 103(a): claim 4 as being unpatentable over Hishiya; claims 13-16, 20-23 and 27-28 as being unpatentable over Hishiya and further in view of U.S. Patent No. 6,630,713 to Geusic et al. ("Geusic"); claims 1-5, 11, 12 and 25-26 as being unpatentable over U.S. Patent Application Publication No. 2003/0087532 to Wu et al. ("Wu") in view of Hishiya; and claims 13-24, 27 and 28 as being unpatentable over Wu in view of Hishiya and further in view of Geusic. Claims 1, 16 and 25 have been cancelled and, therefore, these rejection are also moot.

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**New Claims 29-35**

Claims 29-35 have been added to re-write the prior claims in a way that more clearly defines Applicants' invention. As explained in the Applicants' prior response, the treating of a substrate in a bath and exposing it to gaseous ozone being conducted within a closed container are clarifications of the originally claim language. Also, these claims are supported, for example, in paragraph 4 of page 4; paragraph 4 on page 6; paragraph 5 of page 6; and Fig. 6. No new matter has been added by the presentation of these new claims.

**New Claims 29-31**

Claim 29 recites "positioning the bath within the closed container; treating the substrate surface by a wet chemical etching process in the bath; saturating at least a portion of the substrate with hydrogen; and removing the substrate from the bath, thereby exposing the substrate to the gaseous atmosphere to form a dry hydrophilic surface having silanol sites for bonding to the other substrate." Applicants respectfully submit that Hishiya does not disclose, teach or suggest all the limitations of claim 29. Specifically, there is no disclosure, teaching or suggestion in Hishiya of positioning a bath within an enclosed container and treating a substrate with an etchant in the bath.

The Examiner states that "paragraph 129 of Hishiya states that each process, including the pre-cleaning process, is performed *within* the oxidation treatment apparatus of FIG. 1" (emphasis added) (see Office Action, ¶12). Applicants respectfully disagrees with the Examiner's reading of paragraph 29, which actually recites "[e]ach of the following process was performed *basically with* the oxidation treatment apparatus with the structure shown in FIG. 1 . . ." (emphasis added). Hishiya states that the precleaning can be performed "with" the oxidation treatment apparatus, not "within" the oxidation treatment apparatus. Paragraph 129 only indicates that at least portion of the oxidation treatment apparatus is used in the process listed. Paragraph 39 of Hishiya clarifies this point, disclosing that only the wafer boat 15 is used in the precleaning process and precleaning is not performed "within" the oxidation treatment apparatus: "[t]he 100 pieces of wafers obtained by the precleaning process were held on the wafer boat 15 made of silicon dioxide which was *then mounted on the cover member 14, . . . said cover*

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*member 14 was inserted into the reaction vessel 12 at a room temperature to position wafers 16 in the processing area PA"* (emphasis added).

Moreover, Applicants respectfully submit that Wu does not disclose, teach or suggest all the limitations of claim 29. Specifically, there is no disclosure, teaching or suggestion in Wu of saturating at least a portion of the substrate with hydrogen, removing the substrate from a bath and exposing the substrate to a gaseous atmosphere to form a dry hydrophilic surface having silanol sites. Wu teaches away from saturating the substrate with hydrogen and forming a dry hydrophilic surface. As the Examiner indicated, Wu does not teach immersion of the work piece in a closed container (Office Action, p. 6). In addition, Wu suggests rinsing the device precursor with deionized water after etching (Wu at Paragraph [0042]). Furthermore, Geusic does not disclose, teach or suggest forming a dry *hydrophilic* surface with silanol sites. Rather, Geusic discloses forming *hydrophobic* surfaces for bonding.

As all the features recited in independent claim 29 are not disclosed, taught or suggested by Hishiya, Wu or Geusic, Applicants submit that this claim is allowable over Hishiya, Wu and Geusic. Dependent claims 2-15, 26, 28, 30 and 31 and are dependent from independent claim 29 and are allowable for at least the same reason as discussed above in connection with claim 29.

#### New Claims 32 and 33

Claim 32 recites "placing a first substrate having an oxide layer in a bath, wherein the bath is positioned within a closed container having a gaseous ozone atmosphere; immersing the first substrate in the bath containing an etchant, thereby removing the oxide layer and providing an etched hydrophobic surface; saturating the surface with hydrogen; [and] removing the etched hydrophobic surface from the bath to expose the surface to the gaseous ozone atmosphere, thereby forming a dry hydrophilic surface . . . ." Applicants respectfully submit that Hishiya does not disclose, teach or suggest all the limitations of claim 32. Specifically, as discussed above, there is no disclosure, teaching or suggestion in Hishiya of a bath containing an etchant positioned within an enclosed container and treating a substrate in the bath. Moreover, Applicants respectfully submit that Wu does not disclose, teach or suggest all the limitations of

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claim 32. Specifically, as discussed above, there is no disclosure, teaching or suggestion in Wu of saturating at least a portion of the substrate with hydrogen, removing the substrate from a bath and exposing the substrate to a gaseous atmosphere to form a dry hydrophilic surface. Furthermore, Geusic does not disclose, teach or suggest forming a hydrophilic surface for bonding.

As all the features recited in independent claim 32 are not disclosed, taught or suggested by Hishiya, Wu or Geusic, Applicants submit that this claim is allowable over Hishiya, Wu and Geusic. Dependent claims 17-24 and 33 are dependent from independent claim 32 and are allowable for at least the same reason as discussed above in connection with claim 32.

#### **New Claims 34 and 35**

Claims 34 and 35 have been added to more clearly define Applicants' invention. No new matter has been added.

Claim 34 recites "placing a first substrate in a bath, wherein the bath is positioned within a closed container having a gaseous ozone atmosphere; immersing the first substrate in the bath containing an etchant, thereby removing the oxide layer and providing an etched hydrophobic surface; [and] removing the etched hydrophobic surface from the bath to expose the surface to the gaseous ozone atmosphere, thereby forming a dry hydrophilic surface on the first substrate having a plurality of silanol sites . . . ." Applicants respectfully submit that Hishiya does not disclose, teach or suggest all the limitations of claim 32. Specifically, as discussed above, there is no disclosure, teaching or suggestion in Hishiya of a bath containing an etchant positioned within an enclosed container and treating a substrate in the bath. Moreover, Applicants respectfully submit that Wu does not disclose, teach or suggest all the limitations of claim 32. Specifically, as discussed above, there is no disclosure, teaching or suggestion in Wu of immersing a substrate in a bath containing an etchant, removing the substrate from the bath and exposing the substrate to a gaseous ozone atmosphere to form a dry hydrophilic surface having silanol sites. Furthermore, Geusic does not disclose, teach or suggest forming a hydrophilic surface for bonding.

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As all the features recited in independent claim 34 are not disclosed, taught or suggested by Hishiya, Wu or Geusic, Applicants submit that this claim is allowable over Hishiya, Wu and Geusic. Dependent claims 27 and 35 are dependent from independent claim 34 and are allowable for at least the same reason as discussed above in connection with claim 34.

In light of Applicants' amendments and remarks, a notice of allowance is respectfully requested. Should the Examiner have any questions or concerns regarding the amendments, remarks or the above-identified application, then a telephonic interview with the undersigned is respectfully requested to discuss any such questions or concerns and to accelerate the allowance of the above-identified application.

Respectfully submitted,

Date: 8-29-06

  
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